WPS4116

International Remittances and the Household: Analysis and Review of Global Evidence

Richard H. Adams, Jr.
Development Research Group (DECRG)
MSN MC4-402
World Bank
1818 H Street, NW
Washington, DC 20433
Phone: 202-473-9037
E-Mail: radams@worldbank.org

Abstract

This paper examines the economic impact of international remittances on countries and households in the developing world. To analyze the country-level impact of remittances, the paper estimates an econometric model based on a new data set of 115 developing countries. Results suggest that countries located close to a major remittance-sending region (like the United States, OECD-Europe) are more likely to receive international remittances, and that while the level of poverty in a country has no statistical effect on the amount of remittances received, for those countries which are fortunate enough to receive remittances these resource flows do tend to reduce the level and depth of poverty. At the household level, a review of findings from recent research suggests that households receiving international remittances spend less at the margin on consumption goods – like food – and more on investment goods – like education and housing. Households receiving international remittances also tend to invest more in entrepreneurial activities.

World Bank Policy Research Working Paper 4116, February 2007

-- Forthcoming in Journal of African Economies, December 2006

International migration is one of the most important factors affecting economic relations between developed and developing countries in the 21st Century. At the start of the century it was estimated that about 175 million people – roughly 3 percent of the world population – lived and worked outside the country of their birth (United Nations, 2002). The international remittances sent by these migrant workers to their households back home have a large and profound impact on the developing world. According to *Global Development Finance* (World Bank, 2004), official international remittances sent home by migrant workers represent the second most important source of external funding in developing countries.[1] Official international remittances now total $75 billion per year and are about twice as large as the level of official aid-related inflows to developing countries.[2]

Despite the ever-increasing size of official international remittances, relatively little attention has been paid to examining the economic impact of these transfers on households in developing countries. A host of key policy questions thus remain unanswered: What kind of migrants remit, and how much is remitted to various regions of the developing world? How do international remittances affect the welfare and poverty status of households in various countries? And how do remittance-receiving households consume and invest their remittance earnings?

This paper proposes to answer these, and similar, questions using a three-step approach. First, the paper builds a new data set of 115 developing countries. This data set includes all those developing countries which were reported by the International Monetary Fund (IMF) as having received official international remittances in the year 2003. The paper uses this data set to identify the regional distribution of remittance flows in the developing world, and to analyze the economic determinants of remittance flows. Second, the paper reviews findings from recent household-level research on how remittances affect welfare and poverty in various developing countries.[3] This section finds that the receipt of international remittances increases the level of household income and reduces the level and depth of poverty in the developing world. Third, the paper reviews findings from recent research on how remittance-receiving households consume and invest their remittance earnings. This section shows that households receiving international remittances spend less at the margin on consumption goods – like food –

and more on investment items -- like education and housing. Households receiving remittances also have a higher likelihood of investing in entrepreneurial activities.

This paper proceeds in five sections. Section 1 defines official international remittances and presents the new data set of 115 developing countries. Section 2 uses this macro-level data set to estimate an econometric model to identity the determinants of remittances within the developing world. Moving to the level of the household, Section 3 examines how the receipt of international remittances affects the welfare and poverty status of households in various developing countries. Section 4 then analyzes how households consume and invest their remittance earnings, and the impact of these remittance expenditures on entrepreneurial activities and economic development. Section 5 summarizes the findings and highlights areas for future work.

1. Official International Remittances; Data Set of 115 Developing Countries

It should be stressed at the outset that a variety of data problems make it difficult to accurately examine the impact of international remittances on the developing world. These data problems relate to the way in which information on international remittances is collected and compiled. While the International Monetary Fund (IMF) publishes annual records of the amount of "worker remittances" received by developing countries in its *Balance of Payments Statistics Yearbook*, these IMF data rely entirely on the reporting conventions of the central banks of some 185 developing countries. In other words, while the central banks of many developing countries may receive remittances from their citizens working abroad, and correctly record these income flows as "worker remittances," the central banks in other countries may report such remittance flows under another line item in the balance of payments. In short, there is no reliable and consistent rule for enforcing the way that developing countries report "worker remittances" in their balance of payments. This means that some countries which produce large numbers of international migrants – like the Philippines and the Russian Federation – report receiving little or no "worker remittances" because they (probably) record these remittance flows under another category in their balance of payments.[4] This "mis-categorization" of remittances results in an underestimate of the actual flow of remittance monies returning to certain developing countries.

Another, equally important, data problem is that IMF information on the level of "worker remittances" includes only data on official worker remittance flows, that is, remittance monies which are transmitted through official banking channels. Since a large (and unknown) proportion of worker remittance monies is transmitted through private and unrecorded channels, the level of remittances recorded by the IMF underestimates the actual flow of remittances – official and unofficial -- returning to many developing countries.

In view of these problems, this paper constructs a new data set that includes information on official international remittances for 115 developing countries. These countries were selected because they were listed in the latest (2004) edition of the IMF, *Balance of Payments Statistics Yearbook.* In this data set official international remittances are defined as "worker remittances." The 2004 edition of the IMF *Yearbook* lists data on official international remittances for 76 of these 115 developing countries (66 percent). The 39 developing countries with no remittance data in this edition of the IMF *Yearbook* either did not receive worker remittances in 2003 or they did not report such transfers as "worker remittances."

Table 1 shows the regional distribution of official international remittances for these 115 developing countries over the 5-year period, 1998 to 2003. The data show that two regions of the developing world – Latin America and the Caribbean, and South Asia – receive the lion's share of international remittances. In 2003 these two regions received, respectively, 42.3 percent and 23.9 percent of all official international remittances.[5] By contrast, Sub-Saharan Africa received less than 5 percent of all official international remittances in 2003.

Table 1 reveals that for the developing world as a whole, official international remittances have been increasing at about 8 percent per year. However, in two regions of the world – Europe and Central Asia, and Sub-Saharan Africa – the level of official international remittances actually fell over the last five years.

Table 2 presents another view of the data by showing the distribution of official international remittances by income group of country: low income, lower middle income or upper middle income. In both 1998 and 2003 lower middle income countries – that is, countries with annual GDP per capita between $736 and $2,935 – received the largest

share of remittances. This group of lower middle income countries, which includes many countries from the Latin America and Caribbean region, also recorded the largest percentage increase in remittances between 1998 and 2003. By contrast, the group of low income countries, which includes mainly countries from Sub-Saharan Africa,[6] recorded the smallest increase in official international remittances over the time period.

2. Economic Determinants of Official International Remittances

It is possible to take the data set of 115 developing countries, add various variables, and then estimate an economic model of the determinants of international remittances. This seems useful in order to address several of the key policy questions concerning the economic determinants of international remittances. For example, what is the relationship between poverty, income inequality and remittances? Do the poorest countries of the world tend to produce more international migrants and receive more international remittances than other countries?

The determinants of official international remittances can be analyzed by using the type of gravity model suggested by Greenwood (1975) and Borjas (1987, 1989) for examining international migration. In general terms, such a model can be expressed as:

$$R_{ij} = \alpha_0 + \alpha_1 y_i + \alpha_2 c_{ij} + \varepsilon_{ij} \quad (I = 1, \ldots, N; j = 1, \ldots, N) \qquad (1)$$

where R_{ij} is the flow of per capita international remittances between developing country i and remittance-sending region j, y_i is the per capita income of remittance-receiving country i, c_{ij} is the cost of migrating from country i to region j, and ε is an error term.

Unfortunately, equation (1) cannot be estimated because our data set contains no information on the costs of migration (c_{ij}). Since this problem is also common to other empirical studies, a typical solution is to use the shortest air distance between remittance-receiving and remittance-sending countries as a proxy variable.[7] This is the solution that will be adopted here: the costs of migration will be measured by the air distance from the developing country to one of three major remittance-sending regions (United States, OECD (Europe) or the Arab Gulf).

In addition to the two explanatory variables listed in equation (1) – per capita income and migration costs – it seems likely that other economic, demographic and financial variables may also influence the receipt of international remittances. From an

economic standpoint, it is useful to enter both a per capita income variable and its square in the equation to see if the propensity to receive remittances rises and then declines with level of country income. In other words, developing countries with very low levels of income may be unable to produce many international migrants and so receive international remittances, while developing countries with very high levels of income may lack the incentive to produce migrants and receive remittances. It also seems possible that the level of income inequality may affect the receipt of international remittances. The reasoning here is that countries with higher levels of income inequality may produce more migrants and receive more official international remittances. Similarly, the level of poverty in a country may affect the receipt of international remittances. Controlling for level of income and income inequality, countries with higher rates of poverty may have more people who are willing to go work abroad and remit money back home.[8] With respect to demographic variables, human capital theory generally argues that more educated people are more likely to migrate (Becker, 1993; Harris and Todaro, 1970). It is therefore likely that countries that more educated people might also receive more remittances. For this reason, a variable measuring the share of a country's population that has completed secondary education can be entered into the equation. Finally, financial variables – such as a country's credit worthiness – may also have an effect on remittances.[9] The reasoning here is that migrants might be more likely to remit to countries that have good economic management, as measured by a high international credit rating.

Combining all of these variables together, the empirical version of the model to be estimated can be written as:

$$\begin{aligned} \text{Log } R_{ij} = {} & \lambda_0 + \lambda_1 \log(d_{ij}) + \lambda_2 \log(y_i) + \lambda_3 \log(y_i)^2 + \lambda_4 \log(g_i) \\ & + \lambda_5 \log(pov_i) + \lambda_6 \log(ed_i) + \lambda_7 \log(pop_i) + \lambda_8 \log(crd_i) \\ & + \sum_{j=1}^{5} \beta_{ij} REG + \varepsilon_{ij} \qquad (2) \end{aligned}$$

where d_{ij} is the distance between developing country i and remittance-sending region j, and for each developing country i, y is income (measured by per capita GDP), g is the level of income inequality (measured by the Gini coefficient), pov is the level of poverty (measured by the poverty headcount index[10] set at the international standard of

$1.00/person/day), ed is the share of the population over age 25 that has completed secondary school, pop is population density (people per square mile), crd is country credit rating and REG is a set of 5 dummy variables for various regions of the developing world. The regional dummy variables (East Asia omitted) control for fixed effects by geographic area of the world.

Equation (2) can be estimated in two different ways: (1) the dependent variable can be measured using per capita remittance data from 2003; and (2) the dependent variable can be measured using pooled data, that is, per capita remittance data from both years, 1998 and 2003. Since the first method of estimating equation (2) has only a limited number of observations (n is between 44 and 55), the second method is useful for checking the robustness of results.

The results of equation (2) are shown in Table 3. Columns (1) to (3) of the table show results using the 2003 remittance data for different combinations of economic variables, and columns (4) to (6) show results using the pooled remittance data for both 1998 and 2003. Since all of the variables are expressed in log terms, the results can be interpreted as elasticities.

Four results in Table 3 are noteworthy. The first result concerns the distance variable. In all versions except one of the model the coefficient for distance is negatively and significantly related to the receipt of per capita official international remittances. On average, a 10 percent increase in distance to a remittance-sending region will reduce the level of per capita international remittances received by a developing country by between 6.4 and 6.8 percent.

This result, which parallels those of other studies concerning the relationship between distance and international migration,[11] seems to accord with reality. Developing countries which are located close to major remittance-sending regions – like Latin American countries located close to the United States, or South Asian countries located close to the Arab Gulf -- are also those countries which receive the largest amount of official international remittances. All other things being constant, countries which are located close to major remittance-sending regions receive more remittances because the costs of migration for their citizens are lower.

The second result in Table 3 concerns the per capita GDP income variable (and its square). These two variables are positive and negative, respectively, and highly significant across all versions of the model. This suggests that an inverted U-shaped curve exists between the level of country income (development) and the receipt of per capita official international remittances. In other words, developing countries with low or high per capita GDP incomes receive smaller levels of per capita international remittances than do middle-income developing countries.

Figure 1 uses the data from column (6) in Table 3 to graph the relationship between the receipt of per capita official international remittances and per capita GDP income. According to the figure, the level of per capita remittances received by a country increases until a country has a per capita GDP income (in 1995 prices) of $2,100, and falls thereafter. This means that countries in the upper ranges of the lower-middle income bracket – with annual per capita GDP between $736 and $2,935 -- receive the most in per capita official international remittances. It appears that people from lower-middle income countries possess both the incentive to go work abroad and the ability to afford the travel costs associated with international migration. By contrast, people from low income countries – like Sub-Saharan Africa – lack the financial means to become international migrants and people from higher-income countries lack the incentive to go work abroad.

The third result in Table 3 concerns the human capital variable: share of country population with secondary school education. Rather than being positive and significant, as predicted by human capital theory, this variable is negative and usually statistically insignificant. This outcome suggests that the share of secondary-school educated people in a country's population has no particular effect on the level of per capita remittances received by that country. More empirical work is needed to identify the reasons why this is true.

The final result in Table 3 concerns the poverty variable: poverty headcount measured at $1.00/person/day. This variable is never statistically significant in any version of the model. This means that the level of poverty in a developing country has no particular effect on the amount of per capita international remittances received by that country. One possible interpretation of this finding is that international migrants do not

remit for altruistic purposes in order to help their poor relations at home. Another (more likely) interpretation is that countries with high levels of poverty – like those in Sub-Saharan Africa -- are not producing many international migrants (and thereby receiving international remittances) in the first place. More empirical work is needed to determine which of these interpretations is correct.

3. International Remittances, Welfare and Poverty

Now that the economic determinants of international remittances have been identified at the macro-level in the developing world, it becomes important to identify the impact of these resource flows on welfare and poverty in specific developing countries. Household surveys represent the best source of information for doing this, because these surveys collect disaggregated data on the level of income received by households with and without remittances.

It should, however, be noted that any effort to use household data to examine the impact of international remittances on welfare and poverty involves several important methodological issues. On the one hand, it is possible to treat international remittances as a simple exogenous transfer of income by migrants. When treated as an exogenous transfer, the economic question becomes: How do international remittances, in total or at the margin, affect the observed level of welfare and poverty in a specific developing country? On the other hand, it is also possible to treat international remittances as a potential substitute for domestic (home) earnings. When treated as a potential substitute for home earnings, the economic question becomes: How does the observed level of welfare and poverty in a country compare to a counterfactual scenario without migration and remittances but including an imputation for the home earnings of migrants had those people stayed and worked at home? This latter treatment uses econometric techniques to compare the level of welfare and poverty in a country with and without international remittances.

The rest of this section will draw upon recent papers to illustrate each of these methodological approaches. The first three papers treat international remittances as a simple exogenous transfer of income, and simulate changes in the level of poverty based

upon either the total withdrawal of remittances or a marginal increase in remittance income. The fourth paper compares the observed level of welfare and poverty with a counterfactual scenario without remittances, that includes an imputation for the home earnings of international migrants. The fifth, and final, paper in this section focuses more on international migration than remittances and adopts a different methodological approach to examine how international migration affects child health outcomes. All of these papers show that international migration and remittances have important effects on welfare and poverty.

The first paper, and probably the broadest in scope, uses results from household surveys in 71 developing countries to analyze the impact of international migration and remittances on poverty in the developing world (Adams and Page, 2005). Since international migration and remittances may be endogenous to poverty outcomes, the paper uses various instruments – including distance between remittance-sending and receiving countries – to correct for this problem. Using these instruments, and controlling for the level of income, income inequality and geographic region, the paper finds that a 10 percent increase in per capita official international remittances in a developing country will lead to a 3.5 percent decline in the share of people living on less than $1.00/person/day in that country. Other estimates suggest that a similar 10 percent increase in per capita remittances will reduce the depth of poverty in a country by 3.9 percent. Since both of these results are similar to those produced by non-instrumented estimates, the paper concludes that international remittances reduce both the level and depth of poverty in the developing world.

The second paper uses data from a 1986/87 survey of 7680 households in rural and urban Lesotho to examine how the cessation of international remittances would affect welfare and poverty in that country (Gustafsson and Makonnen, 1993). Lesotho sends large numbers of migrant workers to work in the mines in South Africa. As a result, international remittances represent the main source of income for 35 percent of Lesotho households. Since it is possible that South African employers might stop hiring Lesotho workers, the paper simulates the effects on household welfare and poverty if international remittances would stop altogether. If remittances were set to zero, the paper finds that average per capita household consumption would fall by 32 percent. Moreover, if

remittances were set to zero, the poverty headcount index in Lesotho would increase by 26 percent. In addition, a cessation of remittances would lead to a 52 percent increase in the poverty gap index. The poverty gap index is a more sensitive measure of poverty because it considers the depth of poverty, that is, the amount by which the average income of the poor falls short of the poverty line. In other words, a cessation of international remittances would lead to a larger increase in the depth of poverty as opposed to the level of poverty in Lesotho.

The third paper uses data from a 2003 survey of 1782 households in rural Mexico to examine the marginal impact of international remittances on welfare and poverty in that country (Taylor, Mora and Adams, 2005). As in Lesotho, international remittances account for a sizeable proportion of total per capita household income in rural Mexico: 15 percent. Most of these international remittances come from migrants working in the United States. To analyze the impact of these remittance flows on poverty, the paper develops a national poverty line, which includes the cost of basic food and nonfood items in rural Mexico.[12] According to this poverty line, about 58 percent of all rural Mexican households have per capita incomes below the poverty line. To demonstrate the impact of international remittances on poverty, the paper estimates the rural poverty effects of a 10 percent increase in international remittances. The paper finds that such an increase in international remittances would reduce the poverty headcount and the poverty gap indices by 0.77 and 0.53, respectively. In other words, in rural Mexico international remittances reduce both the level and depth of poverty.

The fourth paper uses data from a 2000 survey of 7276 households in urban and rural Guatemala to compare the observed level of welfare and poverty in that country with a counterfactual scenario without remittances (Adams, 2005a). To establish the counterfactual, the study uses predicted income functions to estimate per capita household incomes in two situations: excluding remittances (but including an imputation for the home earnings of international migrants had they stayed home); and including remittances.[13] The results show that in the including remittances situation, the mean level of international remittance-receiving households is about 40 percent higher than for households not receiving remittances. In other words, the receipt of international remittances greatly increases the level of per capita household incomes in Guatemala.

With respect to poverty, the paper finds that the receipt of international remittances reduces the poverty headcount index by 1.6 percent and the more sensitive poverty gap index by 12.6 percent. This means that international remittances have a greater impact on reducing the depth as opposed to the level of poverty in Guatemala.

Table 4 from the Guatemala paper shows why international remittances reduce the depth of poverty more than the level of poverty. This table ranks all 7276 households in the Guatemala data set into decile groups on the basis of per capita expenditure (excluding remittances). Column (2) of this table shows that households in the lowest decile group receive a huge share – over 60 percent -- of their total household income from international remittances. When households in this bottom decile group – the "poorest of the poor" -- receive international remittances their income status changes dramatically. This in turn has a large effect on any poverty measure – like the poverty gap – which considers both the number and the distance of poor households beneath the poverty line. By contrast, Table 4 shows that households near the poverty line (roughly the fifth decile group) do not receive a very large proportion of their household income from remittances. As a result, the poverty headcount measure does not decline much in Guatemala with the inclusion of international remittances in household income.

The fifth paper focuses more on international migration than remittances, and adopts a different methodological approach to examine the impact of international migration on child health outcomes in rural Mexico (Hildebrandt and McKenzie, 2004). Based on a nationally-representative 1997 demographic survey of 16,500 children in 12,400 households in rural Mexico, the paper compares differences in infant mortality, birth weight and health inputs between international migrant and non-migrant households. About 19 percent of the survey households have an international migrant. Since international migration may be endogenous to health outcomes, the paper uses instruments – focused on historic Mexico-to-US migration patterns – to control for this problem. Using these instruments, and controlling for various factors, the paper finds that children born in international migrant households are 3 percent less likely to die in their first year than children in non-migrant households. Children born in an international migrant household are also estimated to weigh 360 grams – 0.64 of a standard deviation – more than children in non-migrant households. The paper suggests that these positive

health outcomes are caused by increased income and wealth, that is, international remittances raise the health status of rural Mexican households by providing these households with more money to invest in child health.

4. International Remittances, Consumption, Investment and Development

In examining the impact of international remittances on development, the basic question is simple: How are remittance monies spent or used? Do households receiving remittances channel these earnings into human and physical capital investments, or do they merely use these monies to purchase new "status-oriented" consumer goods?

In the past, researchers have often taken a rather pessimistic view of how remittances are spent or used and the impact of these monies on development. For example, a recent review of the literature by Chami, Fullenkamp and Jahjah (2003:10-11) reported three stylized facts: first, that a "significant proportion, and often the majority," of remittances are spent on consumption; second, that a smaller part of remittance funds goes into saving or investment; and third, the ways in which remittances are typically saved or invested – in housing, land and jewelry – are "not necessarily productive" to the economy as a whole.

Several interrelated factors seem to be responsible for this dim view of the impact of remittances on economic development. On a most basic level, since decisions on how to spend remittances are made by thousands (if not millions) of individual households, it is difficult to establish exactly how these monies are used. Much of the literature in this area thus tends to be anecdotal, rather than empirical. At the same time, household budget surveys, which represent the best possible source of information about how remittances are spent, are often poorly designed. Oftentimes, these household surveys ask "naïve" questions about remittance earnings were spent or used. Since remittances are fungible like any other source of income, simply asking respondents about how remittances were spent is not enough. Remittances that are not being spent directly on investment may well have freed other resources for expenditures on investment. Third, the small handful of empirically-based studies that do exist on remittances and economic development are often based on small, unrepresentative household samples. For instance, the Adams (1998) study of how international remittances are used in rural Pakistan is

based on only 500 households.[14] Clearly, there is a need to extend the scope of these studies to examine the impact of remittances on economic development by using larger, nationally representative samples.

The rest of this section will examine how remittances are spent or used at the household level by drawing upon the results of five recent papers. Each of these papers is based on a large, (usually) nationally-representative sample from a different developing country, and each study finds that international remittances has a positive effect on some aspect of development.

The first, and probably most ambitious, paper uses four linked household surveys from the Philippines to analyze how exchange rate shocks during the 1997 Asian financial crisis affected the expenditure patterns of 1646 Philippine households receiving international remittances (Yang, 2004). Since the paper has panel data from before and after the 1997 crisis, it is able to analyze how different types of exchange rate shocks – positive and negative -- affected changes in the expenditure patterns of remittance-receiving households. This represents a type of "natural experiment," because the size and direction of exchange rate shocks are probably uncorrelated with other household-level shocks. As shown in Table 5, the study finds that positive exchange rate shocks had no statistical effect on the level of expenditures by remittance-receiving households on food. In other words, households receiving more remittance income as a result of favorable exchange rate shocks are not "wasting" such income on increased food consumption. Rather, Table 5 shows that positive exchange rate shocks led to a statistically significant rise in remittance-household expenditures on education, and a reduction in total hours worked by male children. For example, a one-standard deviation increase in the size of the exchange rate shock led to a 0.4 percent increase in remittance-household expenditures on education in the Philippines. The paper also finds that favorable exchange rate shocks were associated with increased investment by remittance-receiving households in entrepreneurial activities, specifically transportation, communication and manufacturing enterprises. In all likelihood, households receiving more remittances as a result of positive exchange rate shocks were able to invest more in these relatively capital-intensive enterprises because they no longer faced the credit constraints that had previously hindered such investments.

The second paper expands upon the theme of remittances and investment in entrepreneurial activities by using a 1988 survey of 1526 Egyptians migrants who had worked abroad and then returned home (McCormick and Wahba, 2001). Since the survey includes data on the pre- and post-migration employment histories of migrants, the paper is able to examine how international migration and remittances affect the probability that a migrant will become an entrepreneur -- employer, self-employed person or business owner – upon return from working abroad.[15] The paper finds that two factors – time spent working abroad and total amount of money saved abroad – have a positive and significant effect on the likelihood of a return migrant becoming an entrepreneur. However, these two factors work differently for literate as opposed to illiterate migrants. For the 70 percent of return migrants in the Egyptian data set who are literate, the primary factor affecting the probability of becoming an entrepreneur is the amount of time spent working abroad. By contrast, for the 30 percent of return migrants in the Egyptian data set who are illiterate, the total amount of money saved abroad is the most important factor. According to the paper, illiterate Egyptian migrants may not learn many new skills working abroad, and this is the reason that savings accumulated abroad – rather than time spent abroad – is the critical factor affecting the likelihood of becoming an entrepreneur.

The third paper continues on the theme of remittances and entrepreneurship by examining how international remittances affect the level of capital invested in 6044 small enterprises in urban Mexico (Woodruff and Zenteno, 2004). Most of the enterprises included in this 1998 survey are, in fact, micro-firms: 60 percent of them hire no employees and the median cost of invested capital in all firms is less than $1500. Since it is important to separate the supply of wealth/credit from the demand for investment capital, the paper identifies an instrumental variable -- the historic rate of Mexico-to-US migration – which is correlated with access to wealth but not with demand for credit. Using this instrumental variable, and controlling for various factors, the paper finds that international remittances (principally from the United States) are responsible for more than 25 percent of all capital invested in small and micro-enterprises in Mexico. Within those regions of Mexico with the highest rates of migration to the United States, the paper estimates that remittances are responsible for 40 percent of all capital invested in these

enterprises. Like the work in the Philippines, the paper finds that access to international remittance income helps to overcome the wealth and credit constraints that tend to restrict small and micro-business activity in the developing world.

The fourth paper uses a 1997 household survey of 14,286 people (aged 6-24) to examine the impact of international remittances on school retention rates in El Salvador (Edwards and Ureta, 2003). International remittances represent a key source of household income in El Salvador: in 1997 about 15 percent of all households received international remittances. While standard economic theory suggests that the source of income should not affect how money is spent, the paper analyzes how two different types of income – income from other sources and remittance income – affect the household choice of schooling levels for children. The results suggest that the source of income does matter for investment in schooling: income from remittances has a much larger impact on school retention rates than income from other sources. In urban areas in El Salvador, international remittances have 10 times the size of the effect of other income on the hazard of dropping out of school. For example, in urban areas the average level of remittances lowers the hazard that a child will drop out of elementary school (grades 1-6) by 54 percent. In rural areas in El Salvador, international remittances have a smaller effect on school retention rates, but still the average level of remittances in rural areas lowers the hazard rate that a child will drop out of elementary school by 14 percent. According to the paper, one possible reason why remittance income has a greater impact on school retention rates than income from other sources is that households may have a higher propensity to spend on education out of remittance earnings.

The fifth paper uses data from a 2000 survey of 7,276 households in urban and rural Guatemala to analyze how international remittances affects the marginal spending behavior of households on consumption and investment (Adams, 2005b). The paper compares the marginal budget shares of remittance-receiving and non-remittance receiving households on six consumption and investment goods: food, consumer goods, housing, education, health and other (household services, transport, legal). Table 6 presents the marginal budget shares on these goods. Like the study in the Philippines, the table shows that households receiving international remittances actually spend less at the margin on food than do households with no remittances. Instead, remittance-receiving

households in Guatemala spend more at the margin on investment goods, specifically, housing and education. At the margin, Table 6 shows that households receiving international remittances spend 2 percent more on housing and 58 percent more on education than do households with no remittances. When disaggregated by level of education, most of these increments to expenditure on education go into secondary school education. At the margin, households receiving international remittances spend 142 percent more on secondary education than do households with no remittances. The paper observes that such increased expenditure on secondary school education by remittance-receiving households can help raise the level of human capital in Guatemala, thereby boosting the rate of overall economic growth.

5. Summary and Areas for Future Work

This paper has used a new data set of 115 developing countries and the results of recent household-level studies from 6 developing countries to analyze the impact of official international remittances on the developing world. Five key findings, and two areas for future work, emerge.

First, with respect to the question of which countries receive international remittances, the study shows that two geographical regions dominate: Latin America and the Caribbean, and South Asia. In 2003 these two regions of the developing world received over 65 percent of all official international remittances. By contrast, in that year Sub-Saharan Africa received less than 5 percent of all official international remittances.

The second finding is closely linked to the first. The econometric model developed in this paper shows that two variables – distance and level of country income (per capita GDP) – are the most significant economic factors explaining the receipt of official international remittances. With all other things held constant, countries located closer to a major remittance-sending region -- United States, OECD- Europe, or the Arab Gulf – are more likely to receive more per capita remittances. At the same time, middle-income developing countries – those with annual per capita GDP between $736 and $2,935 -- receive more per capita international remittances, because their citizens possess both the incentive to go work abroad and the ability to afford the travel costs associated with international migration. The combination of these two factors help to explain why

Latin American countries (located close to the United States) and South Asian countries (located close to the Arab Gulf) receive such a high level of international remittances.

The third finding adds a certain twist to the preceding. The results of the econometric model suggest that the level of poverty in a developing country has no particular effect on the amount of per capita international remittances received by a country. With all other factors held constant, countries with more poverty – as measured by the international standard of $1.00/person/day – do not receive more international remittances. One possible interpretation for this unexpected finding is that international migrants do not remit for altruistic purposes in order to help their poor relations at home. Another (more likely) interpretation is that counties with high levels of poverty – like those in Sub-Saharan Africa -- are not producing many international migrants (and thereby receiving international remittances) in the first place. More empirical work is needed to determine which of these interpretations is correct.

Turning to the results of household-level research, the fourth finding of this paper adds an important caveat to the relationship between remittances and poverty. For those countries which are fortunate enough to receive international remittances, remittances do tend to reduce the level and depth of poverty. For instance, in Guatemala the receipt of international remittances reduces the level of poverty (measured by the poverty headcount index) by 1.6 percent and the depth of poverty (measured by the poverty gap index) by 12.6 percent. In rural Mexico, simulation experiments suggest that a 10 percent increase in international remittances will reduce the level of poverty by 0.77 percent and the depth of poverty by 0.53 percent. In both countries, international remittances tend to reduce poverty because households in the lower end of the income distribution are able to produce international migrants and to receive international remittances.

The fifth finding relates to how households receiving international remittances spend or invest their remittance earnings. While previous work has suggested that international remittances tend to be consumed, rather than invested, the works reviewed in this paper show that households receiving remittances actually spend less on consumption – food – and more on investment – education and housing – than other types of households. At the margin, households in Guatemala receiving international

remittances spend 15 percent less on food and 58 percent more on education than households with no remittances. Households receiving international remittances also tend to invest more in entrepreneurial activities. Controlling for other factors, households receiving increased remittance income in the Philippines as a result of favorable exchange rate shocks tend to invest more in transportation, communication and manufacturing enterprises. Similarly, in urban Mexico international remittances provide for more than 25 percent of all capital invested in small and micro-enterprises. In both countries, households receiving more remittances are able to invest more in local entrepreneurial activities because they no longer faced the credit constraints that had previously hindered such investments.

The fact that households tend to invest their remittance earnings in education, housing and entrepreneurial activities points to a promising area of future research. All of the studies reviewed in this paper have focused on the first-round effects of international remittances, and have neglected the second- and third-round effects of these transfers on development. For example, an inflow of international remittances into a local economy may lead to a surge in expenditures in housing, which will, in turn, create new income and employment opportunities for nonmigrant households. Increased demand for housing will create new employment opportunities in construction for the poor and unskilled, as well as new business opportunities for merchants selling bricks, wood and other materials. To date, very few studies have tried to evaluate the impact of these second- and third-order effects of international remittances on wages and employment in the local community. This would therefore be a very fruitful area for future study.

The final area for future work concerns the ever-pressing need for better data on international remittances. International institutions – especially the International Monetary Fund – need to make greater efforts to count the amount of international remittance monies that are currently transmitted through private, unofficial channels. It is likely that poor people, especially poor people from countries located near the major remittance-sending regions of the world, tend to remit more through informal, unofficial channels. For this reason, a full and complete accounting of the impact of international remittances on poverty, investment and development needs more accurate data on the

large and currently unknown level of unofficial remittance transfers in the developing world.

Table 1. Regional distribution of official international remittances, 1998 and 2003
(million US dollars)

Region	*1998*	*2003*	*Annual percent change, 1998 to 2003*
East Asia and Pacific	1,668.2 (8)	5,302.1 (7)	+23.1
Europe and Central Asia	8,630.9 (17)	6,507.6 (20)	(-5.5)
Latin America and Caribbean	13,929.3 (21)	31,615.3 (22)	+17.8
Middle East and North Africa	9,424.4 (7)	11,075.9 (5)	+3.3
South Asia	13,293.7 (5)	17,851.9 (5)	+6.1
Sub-Saharan Africa	2,918.8 (19)	2,477.9 (17)	(-3.2)
Total	49,865.2 (77)	74,830.9 (76)	+8.5

Notes: Numbers in parentheses are countries reporting receipt of official international remittances. Official international remittances defined as "worker remittances" as listed in IMF Balance of Payments Statistics Yearbook, and do not include "compensation of employees" or "other current transfers."

Source: IMF, Balance of Payments Statistics Yearbook (2004).

Table 2. Distribution of official international remittances by income group of country, 1998 and 2003 (million US dollars)

Income group of country	*1998*	*2003*	*Annual percent change, 1998 to 2003*
Low income	17,196.8 (27)	22,863.8 (27)	+5.8
Lower middle income	18,711.4 (32)	31,785.3 (30)	+11.2
Upper middle income	13,957.2 (18)	20,181.8 (19)	+7.6
Total	49,865.2 (77)	74,830.9 (76)	+8.5

Notes: All countries divided into income groups according to 2002 GDP per capita (constant 1995 US dollars), as calculated by World Bank, *World Development Indicators 2004*. The groups are: low income, $735 or less; lower middle income, $736 to $2,935; and upper middle income, $2,936 to $9,075. Numbers in parentheses are countries reporting receipt of official international remittances.

Source: IMF, *Balance of Payments Statistics Yearbook* (2004).
World Bank, *World Development Indicators 2004*.

Table 3: OLS regression on the economic determinants of official international remittances

Variable	*Dependent variable=Per capita international remittances received by country in 2003*			*Dependent variable = Pooled data, Per capita international remittances received by country in 1998 or 2003*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Distance (miles) from developing country to remittance-sending region (US, OECD-Europe or Arab Gulf)	-0.657	-0.680	-0.631	-0.644	-0.672	-0.671
	(-2.38)*	(-1.98)*	(-1.54)	(-3.19)**	(-2.55)**	(-2.35)*
Economic variables						
Per capita GDP (constant 1995 dollars)	9.587	10.551	7.258	9.701	10.186	7.755
	(3.08)**	(3.13)**	(2.23)*	(4.19)**	(3.89)**	(3.12)**
Per capita GDP^2	-0.654	-0.781	-0.516	-0.653	-0.732	-0.538
	(-2.95)**	(-3.24)**	(-2.25)*	(-3.98)**	(-3.93)**	(-3.02)**
Gini coefficient		4.213	1.143		3.060	0.081
		(2.63)*	(0.75)		(2.62)*	(0.07)
Poverty headcount ($1.00/person/day)		-0.328	-0.347		-0.118	-0.163
		(-1.33)	(-1.45)		(-0.61)	(-0.79)
Human capital, demographic variables						
Share of population over age 25 with secondary education	-0.558	-0.030	-0.074	-0.710	-0.177	-0.293
	(-1.67)	(-0.07)	(-0.18)	(-2.78)**	(-0.54)	(-0.91)
Population density (people per square kilometer)	0.384	0.657	0.372	0.411	0.593	0.318
	(2.01)*	(2.92)**	(1.41)	(2.98)**	(3.61)**	(1.62)
Financial variables						
Country credit rating			-1.179			-0.735
			(-1.01)			(-0.80)
Regional variables (East Asia omitted)						
Europe, Central Asia			-1.067			-1.854
			(-0.63)			(-1.62)
Latin America, Caribbean			1.908			1.352
			(1.34)			(1.39)
Middle East, North Africa			1.262			0.859
			(0.67)			(0.70)
South Asia			1.288			0.772
			(0.98)			(0.87)
Sub-Saharan Africa			-0.041			-0.442
			(-0.03)			(-0.40)

Table 3: OLS regression on the economic determinants of official international remittances

Constant	-27.276	-44.726	-19.243	-28.420	-40.640	-18.374
	(-2.49)*	(-3.81)**	(-1.45)	(-3.46)**	(-4.51)**	(-1.90)
N	55	45	44	109	88	84
Adj R^2	0.271	0.367	0.572	0.282	0.313	0.538
F-Statistic	5.02	4.65	5.42	9.48	6.67	8.43

Notes: Estimates obtained using ordinary least squares. All variables expressed in logs; t-ratios shown in parenthesis. Number of observations reduced for certain equations because of missing values.

* Significant at the 0.05 level ** Significant at the 0.01 level

Sources: Per capita GDP data from World Bank, World Development Indicators (2004); inequality and poverty data from World Bank, PovcalNet (2004); education data from Barro and Lee (2001); population data from World Bank, Development Data Platform (2005); and country credit ratings from Institutional Investor.

Table 4. Distribution of households in Guatemala receiving international remittances, ranked by decile group according to predicted per capita household expenditure (excluding remittances)

Rank (decile)	*Households receiving international remittances (from USA)* (1) (percent)	*International remittances as percent of total per capita household expenditure (including remittances)* (2) (percent)
Lowest 10	11.8	62.1
Second 10	4.1	37.0
Third 10	3.0	31.5
Fourth 10	4.6	32.5
Fifth 10	10.7	25.9
Sixth 10	10.1	31.3
Seventh 10	14.1	24.0
Eighth 10	12.2	20.9
Ninth 10	17.8	15.9
Top 10	11.6	17.2
	100.0	

Notes: Households ranked into decile groups on the basis of predicted per capita household expenditure (excluding remittances). Column (2) shows the percent of total per capita household expenditure (including remittances) coming from international remittances.

Source: Adams (2005a: Table 7).

Table 5. OLS regressions on impact of migrant exchange rate shocks in the Philippines, 1997-1998

	No controls	*With controls for region* urban and pre-crisis household and migrant characteristics*
	(1)	(2)
Panel A. Household expenditure *(household-level regressions)*		
Total household expenditures		
Food expenditures	-0.01	-0.007
	(0.036)	(0.034)
Non-food expenditures	-0.032	-0.041
	(0.057)	(0.063)
Panel B. Household educational expenditures *(household-level regressions)*		
Education expenditures (as fraction of initial household income)	0.016	0.026
	(0.010)	(0.013)**

Panel C. Labor supply of children aged 10-17 *(individual-level regressions)*

	Females		Males	
	No controls	With controls for region* urban and pre-crisis household and migrant characteristics	No controls	With controls for region* urban and pre-crisis household and migrant characteristics
	(1)	(2)	(3)	(4)
Total hours worked	-2.753	-2.14	-1.448	-3.234
	(2.044)	(2.246)	(1.711)	(1.411)**
Hours worked:				
For employer outside household	-1.276	-0.547	-0.52	-0.268
	(1.392)	(2.023)	(0.978)	(1.411)
As worker without pay in family-operated farm or business	-1.693	-1.837	-2.786	-4.942
	(0.793)**	(0.936)*	(1.297)**	(1.533)***

Notes: Each cell of table presents coefficient estimate on exchange rate shock. Standard errors in parentheses. Number of observations for household-level regressions is 1646; number of observations for individual-level regressions is 579 (females) and 609 (males).

* Significant at the 0.10 level
** Significant at the 0.05 level
*** Significant at the 0.01 level

Source: Yang (2005: Table 4).

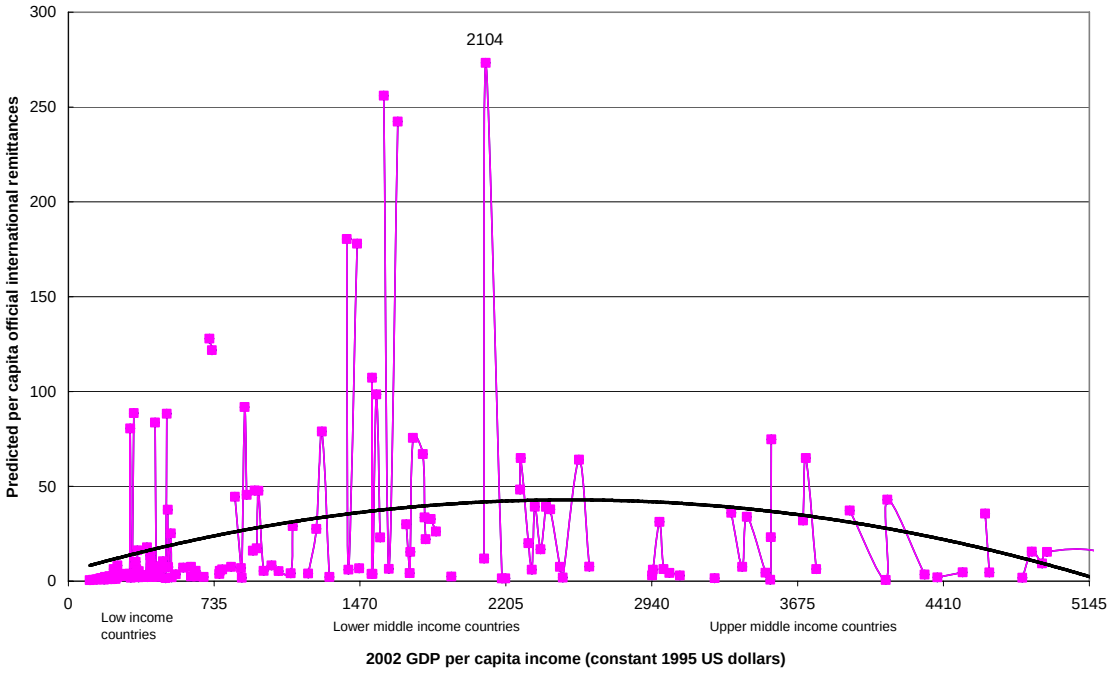
Table 6. Marginal budget shares on expenditure for non-remittance and remittance-receiving households, Guatemala, 2000

Expenditure Category	*Households receiving no remittances (N=5665)*	*Households receiving international remittances (from USA) (N=593)*	*Percentage change (No remittances vs. international remittances)*
Food	0.386	0.330	(-14.77)
Consumer goods, durables	0.203	0.229	+12.81
Housing	0.183	0.187	+2.18
Education	0.031	0.049	+58.06
Health	0.023	0.023	---
Other	0.173	0.177	+2.31
Total	1.000	1.000	

Notes: In the dataset, 1063 households receive international remittances (from Guatemala) and results for these households are not reported here. Some figures do not sum to unity because of rounding.

Source: Adams (2005b: Table 5)

Figure 1. Relationship between per capita official remittances and GDP per capita income



Notes

[1] Foreign direct investment (FDI) is the most important source of external funding for developing countries. In 2003 the developing world as a whole received about $130 billion in FDI, and about $75 billion in official international remittances.

[2] In this paper official international remittances are defined as "worker remittances," as listed (code 2 391) in annual publications of the IMF, *Balance of Payments Statistics Yearbook.* Official international remittances in this paper do not include other line items listed in the IMF *Yearbook* -- items such as "compensation of employees" or "other current transfers" -- because it is not clear if these items are, in fact, "remittances." Also, official international remittances in this paper do not include the large – but unknown – amount of remittance monies that is transmitted through unofficial and informal channels.

[3] Several of the papers reviewed in sections (3) and (4) of this paper were written under the auspices of the Program on International Migration and Development at the World Bank. This World Bank program analyzes: (1) the development impact of remittances; (2) brain drain; (3) temporary migration; and (4) trade, FDI and migration.

[4] While the Philippines and the Russian Federation both produce large number of international migrants, IMF, *Balance of Payments Statistics Yearbook* show that the Philippines received only $202 and $236 million in worker remittances in 1998 and 2003, respectively, and that the Russian Federation received zero in 1998 and $300 million in 2003.

[5] In the case of Latin America and the Caribbean, most of these international remittances came from workers working in the United States; for South Asia, most international remittances came from workers working in the Persian Gulf.

[6]In the data set, 28 of the 44 countries in the low income group are located in Sub-Saharan Africa.

[7]See, for example, Borjas (1987: 545-547).

[8]To avoid possible correlation problems between variables, the poverty (and inequality) variables are measured using data from household budget surveys, while the per capita GDP variables are measured using national accounts data.

[9] Another financial variable that might have an impact on remittances is exchange rate premium, that is, the difference between official and black market exchange rates. It is possible that countries with larger exchange rate premium will receive less in remittances through official channels, and more remittances through (unrecorded) unofficial channels. However, there are no data available for exchange rate premium for the year 2003.

[10] The poverty headcount index measures the percent of the population living beneath the poverty line which, in this case, is set at the international standard of $1.00 per person per day in 1993 purchasing power parity (PPP) exchange rates. The PPP exchange rates are used so that $1.00 is worth roughly the same in all countries. PPP values are calculated by pricing a representative bundle of goods in each country and comparing the local cost of that bundle with the U.S. dollar cost of the same bundle.

[11]For work on the relationship between distance and international migration, see Karemera, Oguledo and Davis (2000); Vogler and Rotte (2000); and Hatton and Williamson (2003).

[12] This national poverty line was estimated by the Mexican Government (SEDESOL), and includes the cost of basic expenditures for food, health, education, clothing, shelter, utilities and transportation. For more details, see Taylor, Mora and Adams (2005).

[13] Since the use of econometric techniques to predict the incomes of households with and without remittances is problematic in the presence of selection bias, the Guatemala paper uses a Heckman-type selection procedure to test for selection bias. The paper finds that the extent of selection bias in this household sample from Guatemala is small and statistically insignificant. For more details, see Adams (2005a).

[14] In rural Pakistan Adams (1998) found that international migrants had a high marginal propensity to invest in two kinds of physical assets: irrigated and rainfed land.

[15]For a similar study on how international migration affects the employment patterns of return migrants in Tunisia, see Mesnard (2004).

References

Adams, Jr., Richard. 1998. "Remittances, Investment and Rural Asset Accumulation in Pakistan." Economic Development and Cultural Change, 47, 155-173.

Adams, Jr., Richard. 2005a. "Remittances, Selection Bias and Poverty in Guatemala." Unpublished manuscript. World Bank, Washington, DC.

Adams, Jr., Richard. 2005b. "Remittances, Household Expenditure and Investment in Guatemala. Policy Research Working Paper 3532. World Bank, Washington, DC.

Adams, Jr., Richard and John Page. 2005. "Do International Migration and Remittances Reduce Poverty in Developing Countries?" World Development, 33, 1645-1669.

Becker, Gary. 1993. Human Capital. Chicago: University of Chicago Press.

Barro, Robert and Lee, Jong-Wha. 2000. Data Set on Educational Attainment of the Total Population Aged 25 and Over. Available on the web site of the Center for International Development at Harvard University (www.ksg.harvard.edu/CID)

Borjas, George. 1987. "Self-Selection and the Earnings of Immigrants." American Economic Review, 77, 531-553.

Borjas, George. 1989. "Economic Theory and International Migration." International Migration Review, 23, 457-485.

Chami, Ralph, Connel Fullenkamp and Samir Jahjah. 2003. "Are Immigrant Remittance Flows a Source of Capital for Development?" International Monetary Fund Working Paper 03/189. Washington, DC.

Edwards, Alejandra and Manuelita Ureta. 2003. "International Migration, Remittances and Schooling: Evidence from El Salvador." Journal of Development Economics, 72, 429-461.

Greenwood, M. 1975. "Research on National Migration to the United States: A Survey." Journal of Economic Literature, 13, 397-433.

Gustafsson, Bjorn and Negatu Makonnen. 1993. "Poverty and Remittances in Lesotho." Journal of African Economies, 2, 49-73.

Harris, John and Michael Todaro. 1970. "Migration, Unemployment and Development: A Two Sector Analysis." American Economic Reviews, 60, 126-142.

Hatton, Timothy and Jeffrey Williamson. 2003. "What Fundamentals Drive World Migration?" Wider Discussion Paper No. 2003/23. Helsinki, Finland.

Hildebrandt, Nicole and David McKenzie. 2004. "The Effects of Migration on Child Health in Mexico." Unpublished manuscript. Department of Economics, Stanford University, Palo Alto, CA, USA.

Institutional Investor. Various issues.

International Monetary Fund (IMF). 2004. Balance of Payments Statistics Yearbook. Washington, DC.

Karemera, David, Victor Oguledo and Bobby Davis. 2000. "A Gravity Model Analysis of International Migration to North America," Applied Economics, 32, 1745-1755.

McCormick, Barry and Jackline Wahba. 2001. "Overseas Work Experience, Savings and Entrepreneurship Amongst Return Migrants to LDCs." Scottish Journal of Political Economy, 48, 164-178.

Mesnard, Alice. 2004. "Temporary migration and capital market imperfections." Oxford Economic Papers, 56, 242-262.

Taylor, J. Edward, Jorge Mora and Richard Adams. 2005. "Remittances, Inequality and Poverty: Evidence from Rural Mexico." Unpublished manuscript. University of California, Davis, CA, USA.

Vogler, Michael and Ralph Rotte. 2000. The Effects of Development on Migration: Theoretical Issues and New Empirical Evidence. Journal of Population Economics, 13, 485-508.

Woodruff, Christopher and Rene Zenteno. 2004. "Remittances and Micro-enterprises in Mexico." Unpublished manuscript, University of California, San Diego, CA, USA.

World Bank. 2005. Development Data Platform. Washington, DC.

World Bank. 2004. Global Development Finance. Washington, DC.

World Bank. 2004. PovcalNet. Washington, DC.

World Bank. 2004. World Development Indicators. Washington, DC

Yang, Dean. 2004. "International Migration, Human Capital and Entrepreneurship: Evidence from Philippine Migrants' Exchange Rate Shocks." Unpublished manuscript. University of Michigan, Ann Arbor, MI, USA.